

STATE: MONTANA

AGENCY: Montana Fish, Wildlife & Parks

GRANT TITLE: Montana Terrestrial, Riparian & Wetland SWG Conservation Program

MT TRACKING #: T-37-HM-7

FBMS NUMBER: _____

PROJECT 1. SPECIES-BASED CONSERVATION

Conservation efforts at the landscape and community level offer some of the greatest potential to leverage resources and provide benefit to multiple species. Fish, Wildlife and Parks (FWP) proposes to enhance conservation efforts for at risk species or groups of species through focused monitoring and population assessments, focused habitat or species restoration, and partner collaboration.

Expected Results and Benefits

Species-specific enhancement efforts will focus on: 1) developing suitable and effective assessment protocols; 2) conducting assessments to ascertain status, distribution and demographic attributes; and 3) working with partners to implement specific protocols across private and public lands to further identify key conservation needs and implement effective conservation strategies. These efforts will assist with the implementation of various species management plans, continued work on recovery of certain species, gaining a better understanding of population status and distribution, and developing protocols that can be employed by the agency and conservation partners in future monitoring programs. Furthermore, information gained through these efforts will help shape conservation strategies designed to protect and enhance key habitats.

Accomplishments

FWP Avian Conservation Biologist: The Avian Biologist serves to facilitate state-level discussions about bird conservation and implementation of bird monitoring through the Montana Bird Conservation Partnership, and through partnerships with Montana Audubon, Bird Conservancy of the Rockies, Intermountain Bird Observatory, Joint Ventures, University of Montana, Montana State University, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, and the Montana Natural Heritage Program. Communications and coordination on range wide monitoring with other states is accomplished through participation in the Pacific and Central Flyway Nongame Technical Committees, the Association of Fish and Wildlife Agencies and Partners in Flight. This biologist continues to work with partners to establish a holistic statewide monitoring strategy. Currently, this is achieved through species-specific surveys (e.g., black rosy-finch, chimney swift, and golden eagles), U.S.G.S. Breeding Bird Surveys (BBS), and participation in Integrated Monitoring in Bird Conservation Regions (IMBCR). Efforts have been made to increase participation and consistency with BBS, as well as encouraging other partner agencies and organizations to adopt IMBCR methods. Given limited funding, the biologist has worked with Montana Audubon to expand the volunteer base, and adapt appropriate surveys for volunteers (e.g., chimney swift) to reduce the number of species on the Species of Greatest Inventory Needs list. A continual goal is to develop direct ties between monitoring and on-the-ground conservation (e.g., ‘Conserving Montana’s Grasslands’). The Avian Biologist also provides technical assistance to industry (e.g., wind energy development), government (e.g., wildlife friendly improvements), and the public (e.g., living with wildlife).

The avian biologist purchased vault latrine vent covers and stock tank wildlife escape ramps for state parks, fishing access sites, wildlife management areas and for private landowners. These are small, cost-effective fixes that can reduce human caused mortality for Montana's wildlife. More information on the benefits can be found at: <http://tetonraptorcenter.org/our-work/poo-poo-project/>
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_041023.pdf

Grassland Conservation Support: FWP contracted with Bird Conservancy of the Rockies to support a private lands wildlife biologist position in eastern Montana. This position is working to increase USDA Farm Bill conservation program implementation and FWP habitat program delivery, with a special focus on grassland birds. The biologist has provided technical assistance on over 5,000 acres of grassland habitat projects, conducted outreach activities to private landowners and school groups, and developed cooperative working relationships with agency partners. It is estimated the biologist reached over 550 people in FY2017 with the grassland conservation message.

Technical Services: Technical expertise and advice was provided by FWP Nongame Specialists in the areas of wind development, solar energy, cell tower development and habitat conservation projects.

Sensitive Species Modeling and Status Review: The Montana Natural Heritage Program completed predicted suitable habitat models for 86 Species of Greatest Conservation Need. Model results for all species were written up in reports and published online. The only Species of Greatest Conservation Need for which models were not constructed and published online are eight species that do not have sufficient data to produce a meaningful model or are only migratory in Montana.

Additionally, new models were constructed for 38 species (mostly Potential Species of Concern or Species in Need of Inventory), but only four of these have been fully reviewed and published. FWP staff feedback was volunteered in a few cases and proved valuable, especially with regards to changes that improved the accuracy of the long-billed curlew model.

The results of these models are available to all FWP agency personnel on Montana Natural Heritage Program's MapViewer application (<http://mtnhp.org/mapviewer>) within the Single Species Overview task, and are being used in the recently released Environmental Summary Report tool to inform conservation and management decisions. Reports are viewable at <http://mtnhp.org/models/> and the underlying data layers displayed in the reports are available upon request.

The Montana Natural Heritage Program also reviewed the conservation status of 150 species including 41 current Species of Concern. Using the 2004 State Rank Criteria for Montana Animal Species of Concern (http://mtnhp.org/animal/2004_SOC_Criteria.pdf) the status of all amphibian (13) and reptile species (17), many mammal species (105), and some bird species (15) were assessed. Based on results of these reviews the Species of Concern committee is considering a decrease in conservation status rank, i.e., S4 to S5, for 27 species and an increase in conservation status rank for five species. Of the species that are being considered for an increase in conservation status ranking two are mammals facing increasing disease threats or changes in global rank and two are birds facing increasing habitat related threats. Data collected over the past 13 years allowed one bird species previously ranked status "Unknown" to be given a numeric rank. Seven species with very few observations would benefit from additional survey effort for accurate ranking. In addition to recalculating ranks, the rationale behind criteria scores were explicitly recorded and appended to the

Natural Heritage Programs databases. After review by the SOC committee in Fall 2017, these ranking scores and reasons for each species will be published on the Montana Field Guide (<http://fieldguide.mt.gov>) to allow greater transparency of the process used to rank species and the evidence supporting these ranks.

Golden Eagle Migration Monitoring: This project is a collaborative, science-based effort by FWP, Montana Audubon, Last Chance Audubon, and U.S. Forest Service to study the fall migration of golden eagles and other raptors in the Big Belt Mountains of west central Montana. Raptors are key indicators of ecosystem health, and long-term migration counts are the best means to measure population status and trends. The 2016 count season represents the first full season-standardized count at Duck Creek Pass (Figure 1.). Over 2,600 golden eagles were recorded; the highest number of golden eagles recorded at any one raptor migration site during one year in the contiguous U.S. Seventeen species of raptors, and 4,389 birds were recorded between September and November 2016.

Harlequin Duck Habitat Evaluation and Demographic Monitoring: FWP and collaborators marked 18 male and 17 female harlequin ducks in 2016. Of those, five breeding pairs were marked in Montana. Males were banded and implanted with PTTs (Figure 2.). Females were also banded, but instead of PTT implants, geolocators were attached to colored leg bands. The PTT allows biologists to receive data on a preprogrammed schedule via data downloads and generally provides more accurate location information. One mortality occurred within the first week of capture. Although we were unable to rule out the potential for capture myopathy, an investigation of the recovered PTT and the surrounding area suggested that the duck may have been killed by a predator. Migration duration ranged from 1.7 to 9 days with distances between approximately 444 and 1,118 miles. Stopover habitat consisted primarily of rivers and mountain streams while one bird made a single stop on a lake in Washington. Apparent molt areas were Port Angeles, WA; Allison Harbour Provincial Park (Smith Sound), BC; Lyell Island, BC; and Read Island, AK.

Late spring 2017, biologists recaptured four of the females marked in 2016 to remove the geolocators and retrieve the data and captured two new pairs near the Spotted Bear River. Unfortunately, all geolocators malfunctioned and essentially no data was retrieved. Biologists with FWP and GNP have received additional funding to continue work for at least two more years of work.

Bog Lemming Monitoring Protocol Development and Testing: Northern bog lemmings are extremely difficult to capture using traditional live trapping methods. FWP Region biologists collected small mammal scat samples to develop DNA profiles that may help identify the presence of bog lemmings in western Montana. This work is in attempt to develop a non-invasive protocol for detecting bog lemmings that may help prioritize habitat conservation for this Species of Concern. FWP collected and submitted scat samples from fens around western Montana for species identification with the following goals for 2016; 1) determine if muskrat lure on scat boards was more attractive to bog lemmings than non-lured boards, 2) determine if bog lemming DNA can be sequenced from scat collected from natural latrine sites in wetlands, and 3) get a rough estimate of how many scat samples are needed to verify bog lemming presence at wetlands where they have been previously documented. We sampled 10 wetlands, including six sites where bog lemmings were previously trapped and four wetlands that looked like suitable habitat but had never been sufficiently surveyed. Wetlands sampled included nine sites from mountain ranges in west-central Montana (southern Mission Mountains, Rattlesnake Mountains, Sapphires, and Pintlers), and one site in northwestern Montana (Purcell Mountains).

We obtained DNA identifications from 140 (76%) out of 185 total scat samples submitted. DNA identification was obtained from scats collected off boards and from natural latrine sites in the wetlands. The meadow vole was the most commonly detected small mammal from scat samples. We identified northern bog lemmings from 19 scat samples, collected at two wetlands where bog lemmings had been trapped previously, i.e., Finley Fen and Hawkins Pond. Bog lemmings were documented from scats collected on boards at Finley Fen and from scats collected in natural latrine sites at Hawkins Pond. No bog lemmings were identified from scats collected from the other four known bog lemming sites or from any of the wetlands where bog lemmings were not previously documented. Other species detected included the water vole and red-tailed chipmunk.

Initial testing of scat boards baited with muskrat lure with non-lured boards indicated that small mammals overwhelmingly preferred non-lure boards for depositing scat. Bog lemmings were detected at known sites with as few as 16 samples, yet not detected from two known sites with 21 and 23 samples collected. Additional testing of genetic identification from scat would be needed to determine how many scat samples would be needed to have a high probability of detecting bog lemmings. The success rate of detecting northern bog lemmings from scat samples may vary depending on the relative populations of meadow voles and lemmings in any given year and area.

Genetic detection of meadow voles at the Lake Marshall site where a bog lemming was trapped in 2011 was particularly interesting, given that no meadow voles were captured during the 2011 trapping surveys, and only a few meadow voles were captured out of 235 small mammals trapped on the entire Marshall Creek Wildlife Management Area during trapping surveys done in 2010, 2011, and 2012.

Recommendations include more extensive use of non-lure scat boards, collection of additional samples from known bog lemming sites to further quantify sampling efforts needed to detect bog lemmings, and refining genetic identification to fewer markers for testing e-DNA detection from water samples.

High Elevation Bird Monitoring Protocol Development and Testing: While a small number of black rosy-finch surveys were conducted in 2016 substantially more effort was put into mapping potential habitat to guide surveys in 2017 and 2018. As this species most often inhabits high alpine cirques above 9,000 ft. where access is difficult it is important to use existing data and knowledge to efficiently guide survey effort. Extensive mapping of potential black rosy-finch breeding habitat was completed by a university intern in the spring of 2017 using predicted range information been described by the Montana Natural Heritage Program (MNHP) habitat suitability model. Figure 3 provides an example map that could be given to a biologist or volunteer surveyor to direct them to high priority survey areas. A detailed protocol for surveys has also been developed.

Greater Short-horned Lizard Monitoring Protocol Development and Testing: Greater short-horned lizards are a Species of Concern and a Species of Greatest Inventory Need for the state. Nongame specialists in R4-7 worked together to develop a survey protocol and sampling method to increase observations of greater short-horned lizards throughout the state (i.e. outreach within local communities, citizen science, etc.). Biologists worked with a GIS specialist to identify areas within the greater short-horned lizard's range that meets criteria for suitable habitat determined through literature review and expert opinion. Six variables: elevation, landcover, riparian habitat, ruggedness, slope, and soil type were used to develop the habitat suitability model (Figure 4.) We based our values for each variable on previous observations made in the Montana Natural Heritage Program database and defined the parameters for each variable based on 95% CI. Surveys are to be conducted from

May to September using the Amphibian and Reptile Visual Encounter Survey (ARVES) methodology. In FY2017, we conducted one survey per region as a test. We did not detect any greater short-horned lizards, but will conduct more surveys in FY2018 to determine efficiency and utility of survey efforts.

Great Gray Owl Monitoring Protocol Development and Testing: Minor changes were made to the great gray owl survey protocol and a model of potential habitat was used to randomly select survey sites for survey during 2017 and 2018 (Figure 5.). A handful of sites were visited in 2017 as a test of the protocol. We are working to create user friendly site maps and data entry options for volunteers prior to expanding survey efforts for 2018. An assessment to determine the minimum number of surveys required for commenting on species status is pending.

PROJECT 2. SPECIES SURVEY AND INVENTORY

There is a need to continue assessment of the distribution and status of terrestrial species under-represented in state databases and utilize new survey information to support potential conservation actions and assess on-going strategies. FWP intends to prioritize and facilitate partnerships for on-the-ground monitoring of priority species.

Expected Results and Benefits

Species survey and inventory provides critical information to conservation and management decisions across the state. Information also informs range-wide species discussions particularly when species are proposed for listing under the Endangered Species Act. A number of species or species groups have been downlisted within the Montana Species of Concern list or removed from the Montana Species in Need of Inventory list due to targeted species survey efforts in recent years.

Accomplishments

FWP staff and university interns contributed to the monitoring of nongame species through both standardized surveys and the collection of incidental observations. More specific efforts are described below.

Golden Eagle Monitoring: Aerial surveys to locate golden eagle nests have been conducted since 2014. In 2017, the focus continued to be in FWP Region 5 (Bird Conservation Region 10). Surveys were conducted by helicopter in June 2017 targeting areas at high risk of development for wind and/or where predictive models identified highly suitable habitat. All observations of golden eagles and/or nests (noted as active or inactive) were recorded during the survey. A total of 34 adults, 15 nestlings, 14 active nests and 44 inactive nests were recorded during 10 hours of flight time. Surveys were targeted at appropriate habitat, e.g., cliffs and plains cottonwood trees, within selected grid cells. Figure 6 highlights the areas that have been flown in eastern Montana between 2014 and 2017. Additionally, a partnership with Montana Peregrine Institute and citizen scientists provided additional data on activity at multiple nests near Montana rivers during surveys conducted for peregrine falcons.

Integrated Monitoring in Bird Conservation Regions: Through a partnership between FWP, U.S. Forest Service, Bird Conservancy of the Rockies, Bureau of Land Management, and 12 other states, statewide bird monitoring (primarily landbirds) was implemented for the 8th year in Montana. Survey locations were stratified by land ownership and Bird Conservation Regions (10, 11, and 17 in Montana). A total of 213 transects were surveyed between May and July 2016, 81 of which were in part or in whole on private lands. The overall statewide effort resulted in the completion of 2,529

avian point counts (Figure 7.) As part of a multi-year, integrated dataset, this information contributes to distribution and population trends across Montana and the western U.S. A detailed report is available at www.birdconservancy.org. A final report for the 2017 effort will be available early in 2018 (*Meny and Carlisle, Intermountain Bird Observatory, 2016 Field Implementation Report, Oct 2016.*)

Bald Eagle Monitoring in Recently Occupied Parts of the Range: Efforts to monitor bald eagle nests have been reduced to monitoring one-third of the nests annually and focused in areas of recent expansion, i.e. eastern Montana. In early May 2017, an aerial occupancy survey was conducted on the Tongue and Powder Rivers. During the survey, we monitored 23 previously known nests finding 18 occupied and 5 unoccupied by eagles. Three of the unoccupied nests were actually occupied by other species including Canada geese. We observed four new nests classifying three as occupied and one unoccupied by eagles. We observed a total of 24 adults and 34 juveniles. Productivity (number of successful fledglings) is unknown due to an overall reduction in survey effort.

Citizen Science: FWP collaborated with Montana Audubon (Audubon) to support and recruit additional citizen science volunteers to assist with surveys for Species of Greatest Conservation Need and Species of Greatest Inventory Need. FWP biologists identified appropriate survey methodology for black swift, black rosy-finch, and chimney swift. Audubon provided two on-site training opportunities for volunteers to survey black swifts at mountain waterfall sites and provided training and outreach materials for black rosy-finch and chimney swift (Figure 8.) Additionally, Audubon is working to target volunteers outside of traditional interest groups (e.g., Audubon chapters), and engage citizens that are recreating in habitats where observations of these species may be likely, e.g., backcountry guides. Audubon also worked with Montana's Breeding Bird Survey Coordinator (BBS; USGS) to recruit volunteers for vacant BBS routes. Montana's BBS routes were expanded in 2015, and as of 2017, only nine routes are vacant.

Bat Mist-net and Acoustic Monitoring: Although acoustic data is extremely important for determining bat species presence and distribution, mist-net surveys are important for validation of many species given the challenges with correctly identifying acoustic calls. Mist-net surveys also provide valuable information on sex, age, and reproductive status of animals that is unobtainable from acoustic efforts. Previous mist-net efforts in eastern Montana have been limited but are now particularly critical based on the 2015 ESA listing of the Northern myotis as a threatened species. In 2016 we surveyed 23 total sites across the nine counties where the species is listed (Figure 9.) Mist-nets were placed adjacent to or within riparian forest over or near water features. Of the 13 species expected to be found within the project area, nine were captured during surveys. Of these species, the hoary bat and little brown myotis are classified as Species of Concern, the eastern red bat and silver-haired bat are classified as Potential Species of Concern, and the northern myotis is listed as federally threatened. In total there were 129 individual bats captured.

Acoustic monitoring efforts continued throughout Montana this past year in an effort to increase baseline information on all bat species and their distribution in the face of white-nose syndrome, but particularly in areas under-represented in acoustic detection databases.

Black Swift Monitoring: FWP staff conducted aerial reconnaissance of potential black swift nest habitat in FWP Regions 1 and 2. Criteria for judging the suitability of waterfalls have been compiled based on the characteristics of known occupied sites and staff experience. Waterfalls in areas with lakes have the most reliable water flows. Waterfalls with good flows, vertical drops and potential

nesting ledges are marked and photographed for follow up ground surveys (Figure 10.) The amount of moss available for nest building, and suitable nest niches cannot be determined from aerial surveys but is documented during ground visits.

FWP staff flew the higher elevations of the Great Burn in the northern Bitterroot Mountains from Lolo Pass north to Deer Creek. Water flows over the waterfalls were quite high and while this area did not have as many suitable waterfalls as the main Bitterroot Mountains some potentially suitable falls were observed. Information from this flight will be used to produce a map showing the distribution of potentially suitable waterfalls and identify those accessible by trail for future ground surveys.

FWP staff also flew waterfalls in northwest Montana finding 16 of 53 to have high potential for swift nesting. Staff also conducted ground-based monitoring at four of five known colonies in northwest Montana. Black swifts were observed at only two waterfalls (Old Highway 2 and Turner Falls). No birds were observed at Ransome Creek and The Crevice. Staff partnered with Montana Audubon and Glacier National Park to learn more about swift distribution in Montana, refine the criteria being used to score waterfall suitability, to increase the number of waterfalls being surveyed, and to increase the consistency of survey methods being used.

See Appendix I for all figures.

IV. PROGRAM FUNDING

FY2017 Grant Funding Segment Requested Amounts:

	Federal		Non-Federal		
	Share		Share		Totals
Direct Costs:	\$334,720		\$180,234		\$514,954
Indirect @ 18.31%:	\$61,287		\$33,001		\$94,288
Total:	\$396,007	65.00%	\$213,235	35.00%	\$609,242

*The non-federal share will be in the form of general license account dollars and donations to the nongame program.

Estimated projects and total direct costs for Montana's Fiscal Year 2017

Project	FY16 Proposed Spending
Project 1: Species Based Conservation	\$ 287,427
Project 2: Species Survey and Inventory	\$ 227,527
TOTAL	\$ 514,954

V. SCHEDULE

All proposed work will be performed between July 1, 2016 – June 30, 2017.

VI. LOCATION

Grant work was conducted across the state as appropriate.

VII. PROJECT PERSONNEL

Adam Brooks, Federal Aid Program Manager	FWP Helena	* 444-3032
Ken McDonald, Bureau Chief	FWP Helena	444-5645
Caryn Dearing, Operations Bureau Chief	FWP Helena	444-3677
Lauri Hanauska-Brown, Nongame Bureau Chief	FWP Helena	444-5209
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Kristina Smucker, Wildlife Biologist (R4)	FWP Great Falls	454-5876
Brandi Skone, Wildlife Biologist (R7)	FWP Miles City	234-0948
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